 Input paper: [[1]](#footnote-1) ENAV18-13.19

Input paper for the following Committee(s): check as appropriate Purpose of paper:

**□** ARM **□** ENG **□** PAP **□ Input**

**□ ENAV □** VTS **□** Information

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Technical Domain / Task Number 2 Working Group 5 (PNT)

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Update of S-240 DGNSS Station Almanac

## Purpose of the document

The primary goal for S-240 is to support a variety of DGNSS-related digital data sources, products, and customers. The S-240 development and maintenance process is specially aimed at allowing direct input from non-IALA members, thereby increasing the likelihood that these potential users will maximize their use of DGNSS data for their particular purposes.

The WG5 of IALA e-Nav Committee is promoting the development of S-240 for the purpose of managing and utilizing the information of DGNSS Station. The discussion was addressed for the first time in the 15th e-Nav Committee meeting and the working draft document 0.0.1 of S-240 was reported to the 17th e-Nav Committee meeting. Currently, the working draft was published under the appropriate part of IALA website. (Address : <http://www.iala-aism.org/products/technical/iho-s-100-gi-registry/S-200-Development-Status>)

This paper describes the update of S-240 development since the 17th ENAV Committee meeting and includes the future plan.

## Related documents

* ENAV15-14.2.5 Statement of work for a Task Group on IALA DGNSS and eLoran databases
* ENAV15-14.2.6 Procedures for managing DGNSS Information
* ENAV16-13.16 Progress on the development of S-240 for DGNSS Station Almanac
* ENAV17-9.13 Report on development work of S-201 AtoN Product Specification

# Discussion

## Update of S-240 development

The working draft document 0.0.1 of S-240 was addressed in the 17th ENAV Committee meeting. The S-240 development team drafted the document based on the survey results for the stakeholders and relevant references on the DGNSS station almanac.

Cho Yonghun, S-240 field manager, has gathered the comments and opinions on the S-240 using a survey form of user requirement. The comments will be discussed during the 18th ENAV committee meeting, for the purpose of preparing a further revision shortly after that meeting.

## Example of S-240 application (Google map service)

The purpose of S-240 is to help member states use the information of DGNSS Station and maximize the utilization. Since the S-240 dataset is created as a format of XML, it’s expected that digital service is available. Korea and IALA have created the S-240 dataset on the list of DGSS station and developed a web page using the S-240 XML dataset which shows the information of DGNSS station on the Google map.

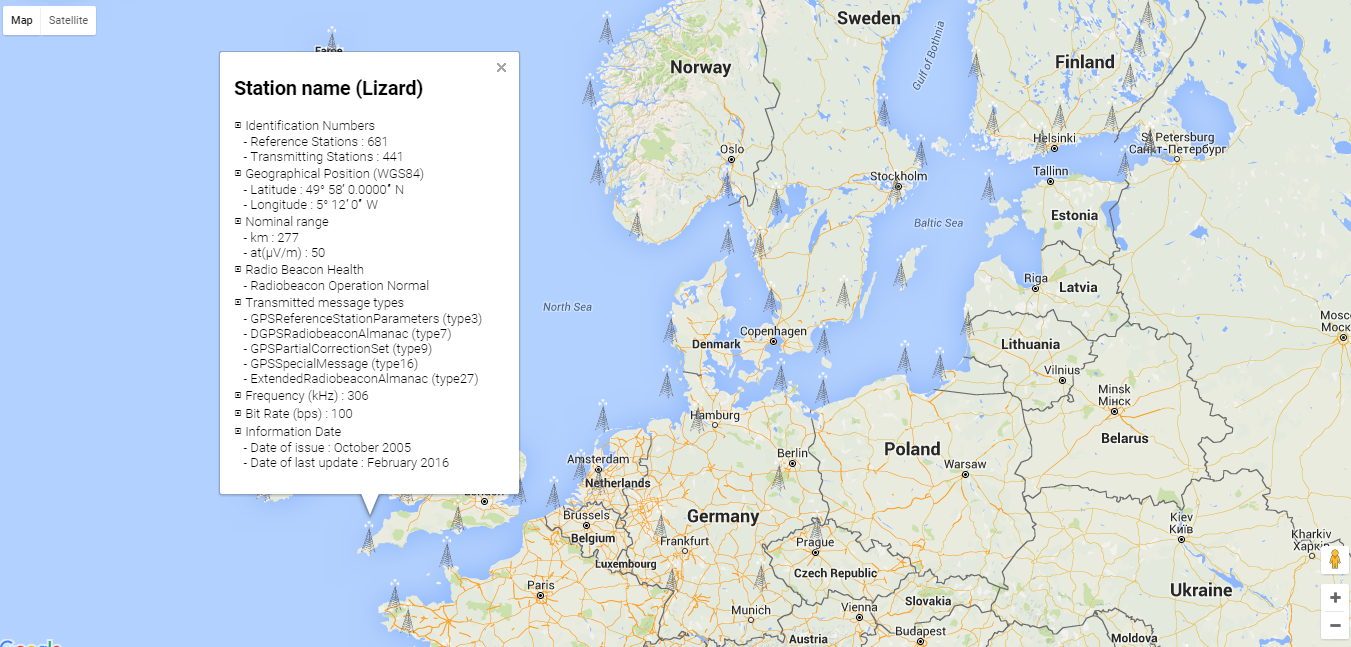


Figure 1. Example of S-240 dataset service on the Google map (<http://218.158.173.219/>)

The example of S-240 application resulted in the usefulness for the purpose of management as well as digital web service. IALA Secretariat will propose to publish the S-240 map service under the page of Radio-Navigation Services in Product section on the IALA website.

In the previous meetings, approach methods to transfer the information of DGNSS station were addressed such as spread sheet (EXCEL) for the interim strategy and S-240 XML format for the long term strategy. The spread sheet is designed to be available in the interoperability with S-240 XML data.

The spread sheet can be used to easily update information DGNSS stations information between IALA and member states as an interim method. It’s required to develop a tool to convert the spread sheet gathered from member states to S-240 XML data. Figure 2 shows the example of spread sheet and the development result of conversion tool.

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Figure 2. Development result of Conversion tool between spread sheet and S-240 XML data

IALA needs to use the spread sheet to gather the information of DGNSS stations and provide the list of DGNSS stations for the interim method. The conversion tool developed by Korea can be used to convert the spread sheet to S-240 XML dataset.

## Future plan on testing the S-240 product specification and S-240 dataset

While paper-based DGNSS station almanac information was used to identify the detailed content on DGNSS station, it will be possible to use the S-240 XML dataset in the DGNSS stations and DGNSS receivers. Korea would promote a research on testing in the DGNSS stations and DGNSS receivers to verify the S-240 product specification and datasets.

<< Test in DGNSS Station >>

* Both Korea and Spain indicate their intention to join the test research
* Select an appropriate DGNSS station to test the S-240 dataset
* Utilize the detailed information of each DGNSS station using the S-240 dataset
* Develop an interface to keep the S-240 data up to date.
* Test the S-240 dataset according to a designed scenario

<< Test in DGNSS receiver >>

* Identify the interested industrial member on the test of S-240 dataset (Trimble already indicated their intention involved in the test)
* Analyse the application case of station information in DGNSS receiver
* Develop an interface module to apply the S-240 dataset to DGNSS receiver
* Test the S-240 dataset in DGNSS receiver
* Summarize the result of S-240 test.

At the moment, it’s not found how S-240 dataset can be beneficial to DGNSS stations and DGNSS receivers. But, Korea would study on the effectiveness and implication of DGNSS station almanac with the test of S-240. In order to test the S-240 in the DGNSS receiver, it’s required to be involved from industrial members. It’s invited to have interest in the test of S-240.

## Considerations for managing the DGNSS Station Almanac

Since the S-240 dataset is created as a format of XML, it’s possible to be used as not only a list of DGNSS station, but also a digital data. In the test of mapping the S-240 dataset on the google map, some matters were found like the following:

* There are some inconsistencies between the real and representing point on the google map occurred by the coordinate difference
* NAD83 is used for the coordinate, not WGS84

The appropriate Coordinate Reference System (CRS) must be determined for the product specification. For example WGS84 (World Geodetic System 1984) should be used for the horizontal reference system for spatial data.

Therefore, the following topics need to harmonize in terms of maximizing the utilization of S-240 and it’s invited to discuss the following:

* Harmonization of the coordinate representation of DGNSS stations
* Harmonization of the geographic coordinate system

# Action requested of the Committee

The Committee is requested to:

1 note the progress and update of developing the S-240

2 provide comments on the future plan of S-240 test

3 discuss the considerations for managing the DGNSS Station Almanac

1. Input document number, to be assigned by the Committee Secretary [↑](#footnote-ref-1)
2. Leave open if uncertain [↑](#footnote-ref-2)